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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/331,723	08/18/1999	JOHN E. BOYNTON	2185-156PCT	2008
7590 10/17/2003 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 220400747			EXAMINER MEHTA, ASHWIN D	
			ART UNIT 1638	PAPER NUMBER

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/331,723	BOYNTON ET AL.	
	Examiner	Art Unit	
	Ashwin Mehta	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 6, 7, 10-16, 18, 20-24, and 43-47 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6, 7, 10-16, 18, 20-24, 43-47 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. The objections to claims 13 and 22 are withdrawn, in light of the claim amendments.
3. The rejection of claims 15, 16, 18, 21, and 24 under 35 U.S.C. 102(e) is withdrawn, in light of Applicants' arguments.

Claim Rejections - 35 USC § 112

4. Claims 1, 2, 4, 6, 7, 10-16, 18, 20-24 remain and new claims 43-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, for the reasons of record stated in the Office action mailed 16 January 2003 under item 6. Applicants traverse the rejection in the paper submitted 16 July 2003. Applicants' arguments were fully considered but were not found fully persuasive.

The aspect of the rejection regarding the term "an" in claims 1 and 15 is withdrawn, in light of the claim amendments.

The aspects of the rejection regarding claims 6 and 22 are withdrawn, in light of the claim amendments.

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Regarding claims 1, 7, 15, and 22, and the recitation, “corresponding to”, Applicants argue that the corresponding amino acid in claims 1, 7, and 15 is the valine at position 13 of SEQ ID NO: 1, and in claim 22, the corresponding nucleotide is guanine at position 37 of SEQ ID NO: 4. Applicants argue one of ordinary skill in the art would have no problem ascertaining the metes and bounds of this claim language (response, page 15, last paragraph). However, it remains unclear whether the corresponding amino acid, in the part of the protein encoded by the DNA fragment, is a valine before it is substituted with another amino acid.

In claim 1: there is insufficient antecedent basis for the recitation “the protein” in line 10 of part (2).

Further in claim 1: the recitation “encodes the part of the protein in which the amino acid corresponding to valine at position 13 of SEQ ID NO: 1, which is substituted by another amino acid” renders the claim indefinite. The recitation is confusing, and does not clearly indicate what is being substituted.

In claim 15: the recitation, “encodes the amino acid corresponding to valine at position 13 of SEQ ID NO: 1 which is substituted by another amino acid” renders the claim indefinite. The recitation does not clearly identify the amino acid residue that is being referred to. As written, the recitation appears to indicate that the DNA fragment encodes a valine, or an amino acid corresponding to valine 13 of SEQ ID NO: 1, but that this amino acid is substituted by another amino acid.

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5. Claims 1, 2, 4, 6, 7, 10-16, 18, 20-24 remain and claims 43-47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for the reasons of record stated in the Office action mailed 16 January 2003 under item 7. Applicants traverse the rejection in the paper submitted 16 July 2003. Applicants' arguments were fully considered but were not found persuasive.

Applicants argue, concerning the issue that a part of a protein does not confer PPO resistance, that claims 1 and 15 require the DNA fragment to be between 2.6 and 13.8 kb in length, and that therefore this issue has been addressed (response, page 17, 3rd full paragraph to page 18, 1st full paragraph). However, DNA fragments as small as 2.6 kb would not encode an entire PPO protein. Randolph-Anderson et al. teach that the *Chlamydomonas* PPO gene has a 6475 nt coding region with 14 exons having an average length of 96 nt, and 13 introns (page 852). Further, there is no indication in the claims at all that the DNA fragments encode a full-length PPO enzyme. Claim 1 even recites, "wherein said sequence encodes the part of the protein".

Applicants also argue, regarding the hybridization conditions recited in the claims, that washing is important when the original hybridization occurs under low stringency, but when conditions such as those recited in the claims are used, that the need for removal of unrelated hybridized sequences does not arise (response, page 19, 1st full paragraph). Applicants offer no support for this argument. Applicants also challenge this assertion, and request that evidence be

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produced to support it (response, paragraph bridging pages 19-20). In response to Applicants' argument and request, the Examiner cites Fourgoux-Nicol et al. (Plant Mol. Biol., 1999, Vol. 40, pages 857-872). Fourgoux-Nicol et al. teach the use of Southern blot hybridization, in which highly stringent conditions were used in the original hybridization, followed by washes that were also conducted under highly stringent conditions (pages 859-860). This clearly demonstrates that workers in the art use highly stringent wash conditions even if the actual hybridization step between the template and probe nucleic acids is also conducted under highly stringent conditions.

6. Claims 1, 2, 4, 6, 7, 10-16, 18, 20-24 remain and claims 43-47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, for the reasons of record stated in the Office action mailed 16 January 2003 under item 8. Applicants traverse the rejection in the paper submitted 16 July 2003. Applicants' arguments were fully considered but were not found persuasive.

Applicants argue that language relating to "a part of a protein" has been removed and the size of the fragments is recited in claims 1 and 15 (response, paragraph bridging pages 20-21). However, the claims provide no indication that all of the DNA fragments encode full-length proteins. Rather the size range of the DNA fragment in the amended claims, 2.6-13.8 kb, encompasses fragments that do not encode a full length protoporphyrinogen oxidase. As discussed in previous Office actions, the specification does not teach that expression of only a

portion of this enzyme conferred resistance to PPO-inhibiting herbicides. Also as discussed in previous Office actions, related U.S. Patent No. 6,160,206 teaches the isolation of the same *Chlamydomonas* clone from the same *Chlamydomonas* strain, and indicates that a 3.4 kb fragment contained only a portion of the mutated PPO gene that is resistant to PPO-inhibiting herbicides, and the fragment, when introduced into a herbicide-sensitive *Chlamydomonas* strain, integrated by homologous recombination into the herbicide-sensitive gene. The herbicide-sensitive PPO gene in the recipient *Chlamydomonas* strain was then converted into a mutant PPO gene, and expressed a mutant PPO that was resistant to PPO-inhibiting herbicides. Therefore, DNA fragments encoding only portions of PPO are not, alone, expressed.

Applicants also argue that one of ordinary skill in the art would have not problem practicing the full scope of the currently claimed invention, and submit a prior art reference, Paszlowski et al. (EMBO J., 1988, Vol. 7, pages 4021-4026), as support that homologous recombination is known in the art (response, page 21, first full paragraph).

However, it is noted that the references cited in the last Office action, discussing the state of homologous recombination in plants, at the time the instant invention was made, were published 14 years after Paszlowski et al. Puchta et al., cited in the last Office action, discusses the many problems and high inefficiency of homologous recombination in plants. Terada et al. also point out that Paszlowski et al. that gene used in the experiments of Paszlowski et al. was artificially modified and was not a natural endogenous gene, and that they only used tobacco plants (page 1030). It is also noted that Paszlowski et al. state "These experiments demonstrate the *possibility* of producing transgenic plants with desired modifications to a specific nuclear

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gene.” (abstract, emphasis added). Paszlowski et al. do not actually teach a method comprising homologous recombination to modify endogenous nuclear genes in plants.

Summary

7. Claims 1, 2, 4, 6, 7, 10-16, 18, and 20-24 remain and claims 43-47 are rejected.

8. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this or earlier communications from the examiner should be directed to Ashwin Mehta, whose telephone number is 703-306-4540. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays from 8:00 A.M to 5:30 P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at 703-306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 and 703-872-9306 for regular communications and 703-872-9307 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

October 14, 2003

A handwritten signature in black ink, appearing to read 'Ashwin D. Mehta', is positioned above the printed name.

Ashwin D. Mehta, Ph.D.
Primary Examiner
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